National Cooperative Dairy Herd Improvement Program
RECORD BOOK
A plan for every size herd
STANDARD DHIA OWNER SAMPLER WEIGH-A-DAY-A-MONTH
AGRICULTURAL RESEARCH SERVICE, U. S. DEPARTMENT OF AGRICULTURE

ARS-44-151
Dairy-Herd-Improvement Letter (Vol. 40, No. 7)

September-October 1964

5,612 SIRES SUMMARIZED IN AUGUST 1964

A total of 1,192 AI and 4,420 non-AI sires were evaluated in August 1964. The evaluations included 264,342 daughters with herdmates, resulted in 14,727 individual sire records, which were provided to the cooperating States, and represented 352,777 records reported since the previous summary. A summary of the number of sire records (DHIA 1202 forms) provided to the States in August 1964 is shown in table 1.

USE OF YOUNG AI BULLS

The genetic potential that can be realized by use of reliably proved AI bulls whose progeny are substantially superior to their herdmates for milk and fat yield was previously discussed in ARS-44-148. Proved AI bulls are not easily obtained. Their development generally takes 5 years or longer. In addition, the cooperation of the artificial breeding organizations and of dairymen who breed a portion of their cows to young unproved bulls is needed to maintain the supply of such herd improvers. To obtain maximum genetic progress, many research studies have shown that young sires should be sampled in many herds and that only the best sires should be used as parents of future generations.

The most effective sampling technique consists of breeding each young untested bull to only enough cows to get a reliable measure of his breeding value. Under this system only a small proportion of the cow population needs to be mated

Issued November 1964

TABLE 1.--Number of sire records summarized 08-64, by State, by breed

State	Ayrshire	Guernsey	Holstein	Jersey	Brown Swiss	Shorthorn	Red Dane	Mixed	Red Poll	Total
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Maine	13	45	103	29	8	3	-	-	-	201
New Hampshire	24	36	123	32	10	4	-	-	-	229
Vermont	26	48	211	84	26	2	-	-	-	397
Massachusetts	35	67	196	54	20	-	-	-	-	372
Rhode Island	8	12	62	9	-	-	-	-	-	91
Connecticut	25	84	191	42	15	-	-	-	-	357
New York	59	127	682	123	50	6	1	1	-	1,049
New Jersey	7	91	187	35	26	-	-	-	-	346
Pennsylvania	48	277	536	85	42	11	-	-	-	999
Ohio	27	143	390	154	55	6	-	-	-	775
Indiana	17	128	288	82	41	9	-	1	-	566
Illinois	19	121	311	54	47	7	-	-	1	560
Michigan	12	57	347	51	34	4	2	-	-	507
Wisconsin	12	123	514	51	62	15	-	-	-	777
Minnesota	30	70	295	40	52	15	-	-	-	502
Iowa	24	69	319	67	61	25	-	-	1	566
Missouri	-	58	141	38	9	9	-	-	-	255
North Dakota	1	12	67	6	14	3	-	-	1	104
South Dakota	11	9	111	9	12	-	-	-	1	153
Nebraska	1	33	124	10	25	5	-	-	-	198
Kansas	13	39	185	20	26	6	-	-	-	289
Delaware	4	20	85	10	4	-	-	-	-	123
Maryland	30	92	310	32	38	2	-	-	-	504
Virginia	18	96	283	35	19	1	-	-	-	452
West Virginia	12	19	109	26	3	-	-	-	-	169
North Carolina	13	74	205	57	21	-	-	-	-	370
South Carolina	2	87	111	45	18	-	-	-	-	263
Georgia	12	41	123	42	16	-	-	-	-	234
Florida	10	76	51	44	9	-	-	-	-	190
Kentucky	6	29	132	46	10	-	-	-	-	223
Tennessee	5	59	96	85	13	5	-	-	-	263
Alabama	6	43	68	50	7	1	-	-	-	175
Mississippi	10	41	36	57	6	-	-	-	-	150
Arkansas	1	16	53	14	4	6	-	-	-	94
Louisiana	-	43	34	28	4	-	-	-	-	109
Oklahoma	9	29	88	21	9	14	-	-	-	170
Texas	9	35	136	66	22	-	-	-	-	268
Montana	3	6	31	5	7	-	-	-	-	52
Idaho	4	44	123	44	9	2	-	-	-	226
Wyoming	-	1	20	-	-	-	-	-	-	21
Colorado	3	34	107	17	21	3	-	-	-	185
New Mexico	-	22	44	6	-	-	-	-	-	72
Arizona	-	33	67	6	3	-	-	-	-	109
Utah	2	25	128	21	4	-	-	-	-	180
Nevada	-	3	8	25	-	-	-	-	-	36
Washington	11	67	163	43	14	4	-	-	-	302
Oregon	7	67	82	80	17	3	-	-	-	256
California	2	36	140	32	8	-	-	-	-	218
Puerto Rico	-	-	8	-	-	-	-	-	-	8
Hawaii	-	-	2	-	-	-	-	-	-	2
Alaska	-	-	1	-	8	-	1	-	-	10
Total	212	1,090	3,189	798	250	79	3	2	1	1/14,727 2/5,624

1/ Represents the number of individual sire records sent to States.
2/ Represents the number of sires summarized.

to unproved bulls. Consequently, most cows can be mated to the best proved bulls currently available. The percentage of cows to be bred in testing young bulls depends heavily on the proportion of cows on official testing and would be minimal when all herds are tested or when young bulls are used only in tested herds. In an example of an AI service area that had a testing rate near the U.S. average, Van Vleck (3) has shown that maximum genetic progress occurs when 75 percent of the cows are mated to proved sires and 25 percent to young bulls. However, if all herds had been on test, it would have been necessary to breed only about 3 percent of the cows to young sires in order to provide the same number of tested daughters.

What risk must a dairyman take when he uses an unproved bull that a stud is sampling? The answer to this question depends largely upon how well the young bull was selected. The genetic merit of a young bull depends upon the breeding value of his parents. If these parents have breeding values of +2,000 or more pounds of milk, a similar level of genetic potential is expected from the progeny. Such outstanding parents are available and can be found in the DHIA Sire Summary List and in the DHIA Cow Performance Index List. The young bulls resulting from the mating of outstanding parents represent new models of the very best genetic material presently available. On the other hand, if the breeding values of parents of young bulls selected for sampling in AI are no better than breed average, the progeny of the young bulls can be expected to be no better than breed average in genetic merit.

Practical results from New York and North Carolina show that progeny of young bulls that were selected and sampled in AI compare favorably with progeny of older bulls in AI. The following tabulation, which represents a comparison of progeny from young sampled bulls with their herdmates in New York and North Carolina, shows that the use of selected young bulls in AI resulted in increased production.

	Number of young bulls sampled and AI proved	Deviations 1/ Milk	Fat
North Carolina	23	+ 52	+ 1
New York	34	+181	+10

1/ Measured as deviations from herdmates in North Carolina and as differences from breed average in New York.

The real value and great potential of a young bull selection and sampling program, however, is demonstrated by the use of 22 out of a total of 57 young bulls that were held for extensive use in AI. These bulls sired progeny that were greatly superior to herdmates and to the breed average, as can be seen from the following tabulation:

	Number of bulls saved	Deviations 1/ Milk	Fat
North Carolina	7	+638	+20
New York	15	+519	+25

1/ Measured as deviations from herdmates in North Carolina and as differences from breed average in New York.

Matings made after enough cows have been serviced to insure an adequate number of progeny for a reliable proving are of little value. However, such services would be of much more value if they were made to sample additional bulls. Only tested cows can contribute to a proof. Consequently, there is little merit in using unproved bulls in herds not on some form of official testing.

The average breeding value of well selected young bulls being sampled in AI may be expected to exceed the average of all others currently available in AI, but it can hardly be expected to exceed that of the very top of those having been thoroughly sampled. In a theoretical example of the use of both young and highly selected proved bulls in AI and under maximum net return conditions, Van Vleck (3) has shown that the daughters of proved bulls should exceed those of young bulls by approximately 380 pounds of milk per year. However, it is emphasized that a well-planned and executed total sire-testing program that produces maximum rates of genetic progress for the dairy cow population must include the sampling of young sires. This requires the cooperation of many herds.

It is not advisable for a herd to use only young bulls, especially only one or several young bulls. However, no great risk is involved if only a small percentage of the herd is used in sampling young bulls in AI and especially if the bulls being sampled have sires and dams with clearly indicated and demon-

strated superior breeding value for production. Dairymen who cooperate in the sampling of young sires are rendering a real service to the AI stud involved and to the industry at large.

Selected References

(1) Legates, J. E.

1964. Report to technical Committee S-49. N. C. Agr. Expt. Sta., 9 pp. (Mimeo)

(2) Spalding, R. W., C. R. Henderson, H. W. Carter, R. Albrectsen, and A. M. Meek.

1963. The selection and evaluation of dairy sires. Cornell Ext. Bul. 1118.

(3) Van Vleck, L. D.

1964. Sampling the young sire in artificial insemination. Jour. Dairy Sci. 47: 441.

PESTICIDES AND AGRICULTURE

The following are excerpts taken from a talk by Dr. Robert J. Anderson, Deputy Administrator, Agriculture Research Service, USDA, at the 7th CDC Biennial Veterinary Conference, Atlanta, Ga., August 7, 1964.

* * * * * *

"You all know that pesticides are a major ingredient of today's modern technology. Without them, production of crops and livestock would be curtailed and the quality of farm products would be lowered. There would be large losses in quantity and quality of food products in marketing and storage, and consumers would probably pay higher prices for poorer products. Production of timber would be reduced and buildings and other structures in which wood products are used would be damaged. Inability to control pests could create serious hazards to human health and welfare. The level of living that we all enjoy would be reduced.

"It's true, of course, that these pesticides are powerful substances, and, if misused, can be harmful to man, animals,

plants, wildlife, and beneficial insects. The Department of Agriculture recognizes these dangers, just as it recognizes our dependence upon these chemical materials. The only solution to this dilemma is through a great expansion of pest-control research, an intensified education effort on proper use of these materials, and a strengthening of pesticide regulations at all levels of government.

"Only a few weeks ago, the President, acting upon the recommendation of the Secretary of Agriculture, asked Congress for an additional $29 million to intensify our work in these areas. We feel this will speed up the development of new and improved pesticides that can be used with the greatest efficiency and safety *** as well as techniques for controlling pests that require minimum amounts of pesticidal chemicals or none at all.

"In the meantime, however, we face some rather critical problems that demand immediate solutions. The most baffling are those associated with the concepts of 'zero tolerance' and 'non-residue' registration. The strict application of these concepts in the use of pesticides on food crops is making some farmers inadvertent offenders of the law and making it difficult for the Department to make recommendations based on current knowledge that won't be outdated in a short time.

"The labeling and marketing of pesticides in interstate commerce is, as you may know, governed by the Federal Insecticide, Fungicide, and Rodenticide Act. After a new pesticide has been developed in an industrial laboratory, an application is submitted to USDA asking that it be registered for use. If the compound is not to be used on a food crop, USDA reviews the experimental data submitted with the application. The compound is registered if it is found that there is no undue hazard to man and domestic animals *** and if convincing evidence has been submitted to prove that the product is safe and effective for the proposed use when applied according to label instructions.

"If, however, the pesticide is proposed for use of food crops, the application for registration must list each crop on which it is to be applied, and must present analytical data on residues and toxicity.

"The information is studied by scientists of the Pesticides Regulation Division of the Department's Agricultural Research Service. If it can be proved that the product leaves no

residue on a particular crop when used as directed, the compound is then registered for use on a no-residue basis. But if the compound leaves a residue, USDA delays registration until an adequate residue tolerance has been established by the Food and Drug Administration.

* * * * * *

"So far, some 60,000 pesticide products, utilizing about 600 active chemicals, have been registered. About two-thirds of these products have been accepted for use on raw agricultural commodities. Over 6,000 such uses are registered and more than half are on a 'no-residue' basis.

* * * * * *

"The development of increasingly sophisticated methods of analysis has rendered the 'no-residue' and 'zero tolerance' concepts almost meaningless, because the levels of detection are constantly being lowered by these new methods. Chemists can determine residues at fantastically low levels -- in parts per billion or even trillion -- whereas a couple of years ago residues were measured in parts per million. With such methods of detection, it has become almost impossible to use a product today without leaving some measurable residue.

"In a number of recent instances, farmers have applied a given pesticide in good faith, in accordance with current instructions, only to find their products subject to seizure because a previously undetectable level of residue has been discovered, no matter how infinitesimal or insignificant in terms of human health.

"This was the situation in Washington, D. C. recently when new and highly sensitive testing procedures revealed traces of heptachlor and dieldrin in milk from some farms in Pennsylvania and Maryland. The insecticides had been applied -- according to registered and recommended use -- to alfalfa which was later fed to dairy cows. Yet, in view of the zero tolerance, when residues of heptachlor and dieldrin were found in alfalfa and in milk, we had no choice but to cancel registration for forage use of both chemicals.

"Recognizing the seriousness of this problem, the Secretaries of Agriculture and Health, Education, and Welfare recently joined in a request to the National Academy of Sciences-National Research Council that a committee of distinguished scientists be established to review the entire problem of 'zero tolerances' and 'no-residue' registrations.

"The Academy has agreed to undertake this study and we should have its recommendations by the end of this year.

* * * * * *

"Because you are in a position to use this understanding to good advantage, let me urge you to help put across the message of safe use of pesticides at every available opportunity -- every time you talk to a farmer *** every time you talk to local groups *** every time you meet with private practitioners who advise farmers *** in fact, in all of your day-to-day contacts with all segments of the public. Don't preach fear, but emphasize sanity in the handling, storage, and use of pesticides."

* * * * * *

USE PESTICIDES SAFELY

If you use pesticides, apply them only when needed and handle them with care. Follow the directions and heed all precautions on the container label. If pesticides are handled or applied improperly, or if unused portions are disposed of improperly, they may be injurious to humans, domestic animals, desirable plants, honey bees and other pollinating insects, fish, and wildlife, and may contaminate water supplies.

U. S. DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Washington, D.C., 20250

Official Business

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF AGRICULTURE